



Bringing virtualized storage intelligence to converged infrastructure

By Achmad Chadran and Shanky Chandra Gowri

Converging IT resources can minimize data center footprint, heighten scalability, and centralize management. Now, Dell™ EqualLogic™ PS-M4110 blade arrays enrich these consolidated environments with advanced, virtualized storage in a blade form factor.

Enterprise-class storage in a blade form factor



The Dell EqualLogic PS-M4110 blade array offers up to 56 TB of fully redundant storage and EqualLogic intelligence for enhanced performance, efficiency, and manageability.

Advanced integration of virtualization in IT environments and the redesign of hardware platforms that optimize virtualization provide a timely opportunity for many organizations to consolidate existing data center resources in a converged IT infrastructure. In some cases, converged infrastructure implementations offer modular computing environments that are scalable and easily managed by integrating server, network, and storage components. These consolidated data center building blocks are designed to be deployed and managed as compact units that help reduce complexity, simplify management, and facilitate scalability while minimizing use of physical space and enhancing power and cooling efficiency.

When consolidating IT resources in a converged data center, IT decision makers need to look beyond storage density and capacity requirements. They also need to avoid the limitations imposed by little or no automation or a lack of centralized management, which in some cases may render available storage options unsuitable for enterprise-class application deployments.

The Dell EqualLogic PS-M4110 Internet SCSI (iSCSI) blade array, a key component in the Dell Converged Blade Data Center architecture, offers virtualized, enterprise-class storage combined with intelligent EqualLogic capabilities in a consolidated blade form factor. The Converged Blade Data Center architecture integrates server, network switches, storage, and cabling within a compact Dell PowerEdge™ M1000e modular blade chassis, helping organizations to simplify management, enhance efficiency, and deploy and expand application clusters quickly. EqualLogic PS-M4110 blade arrays are designed to augment this architecture by offering the same self-optimization, automation, ease-of-use, and data protection features available with traditional, rack-mounted Dell EqualLogic PS Series iSCSI storage area network (SAN) arrays.

EqualLogic PS-M4110 blade arrays feature comprehensive, robust EqualLogic PS Series software to bring EqualLogic intelligence to the Converged Blade Data Center architecture. Comprehensive EqualLogic PS Series features and host integration software are available for every array that is under an active support contract. IT organizations with an up-to-date support contract can at any time download



Data center convergence

Converged infrastructures combine server, network, and storage components to help reduce costs, minimize data center footprint, and enhance efficiency. View this video to learn more about current technologies that enable data center convergence and its many benefits.

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system firmware, host integration tools, and storage monitoring software from the Dell EqualLogic support Web site.

The intelligence available in these arrays enhances the efficiency of virtualized environments supporting application workloads such as Microsoft® Exchange Server messaging, Microsoft SQL Server® database, Microsoft SharePoint® Server collaboration software, and virtual desktop infrastructure (VDI) deployments.

Optimized modular data centers

In addition to the Dell EqualLogic PS-M4110 storage component, the Dell Converged Blade Data Center architecture combines Dell PowerEdge M-Series servers and Dell Force10™ MXL switches in a Dell PowerEdge M1000e blade chassis. This modular architecture is designed to deliver a comprehensive, end-to-end virtualized data center with 10 Gigabit Ethernet (10GbE) connectivity that enables IT organizations to do more while consuming less space, power, and cabling than traditional rack-mounted approaches.

Specifically, shared resources such as chassis-based power and cooling and backplane connectivity help reduce cabling and minimize space requirements cost-effectively. Additionally, unified management through the Dell Chassis Management Controller (CMC) enables rapid

deployment and provisioning without requiring specialized expertise.

The double-wide, half-height blade form factor of the EqualLogic PS-M4110 blade array plugs neatly into the PowerEdge M1000e enclosure. It features dual, hot-pluggable 10GbE controllers, each with 4 GB of memory. The array is available in a variety of disk configurations. These configurations include 14 hot-pluggable 7,200 rpm, 10,000 rpm, and 15,000 rpm 2.5-inch Serial Attached SCSI (SAS) drives and—to suit highly demanding, multitiered workloads—a hybrid configuration consisting of nine SAS drives and five solid-state drives (SSDs). These drive configurations are designed to provide up to 14 TB of storage capacity per array, or 56 TB of storage capacity with four blade arrays within a single blade chassis. The array also includes one dedicated management port that is accessible through the CMC.

EqualLogic PS-M4110 blade arrays extend converged infrastructure storage capabilities by offering familiar, enterprise-class software and features available for EqualLogic PS Series iSCSI SAN arrays. In particular, EqualLogic PS-M4110 blade arrays offer thin provisioning, load balancing, and data tiering automation and optimization, all of which help significantly enhance storage performance, manageability, and efficiency.

Thin provisioning enables organizations to meet capacity requirements while optimizing resource utilization. Automated load balancing helps ensure application responsiveness even in high-demand transaction environments. Automated data tiering facilitates meeting performance requirements cost-effectively. Frequently accessed data can be automatically migrated to performance-optimized storage such as SSDs, while less-frequently accessed data can be migrated to cost-effective disk drives such as SAS drives.

These automation and optimization features help simplify scaling from a single array to multiple arrays within a single chassis or even beyond the chassis to external,

rack-mounted EqualLogic PS Series arrays. For example, within a single chassis, IT organizations can deploy up to four blade arrays. Up to two blade arrays can be deployed in a single group inside the chassis. To expand beyond two arrays within the group, organizations can combine them with other EqualLogic PS6000 and/or EqualLogic PS6500 series arrays outside the chassis to scale storage up to 16 EqualLogic PS Series arrays.

The EqualLogic PS-M4110 blade array in combination with the PowerEdge M1000e chassis also features a modular design and unified management capabilities that allow storage to be provisioned, scaled, and managed efficiently. CMC enables setup, deployment, and monitoring from a centralized interface, helping avoid the need for specialized domain expertise. The hot-pluggable design of the EqualLogic PS-M4110 blade array enables administrators to upgrade drives and controllers without incurring downtime or disrupting applications. Redundancy of controllers, network, and switching layers provides enterprise-class availability.

Converged architecture for specific use cases

One advantage a converged infrastructure brings to organizations is the capability to rapidly deploy and maintain comprehensive, virtualized, highly manageable IT environments. Dell EqualLogic PS-M4110 blade arrays are well suited for specific use cases including virtualized, multiple-application workloads; VDI deployments; and remote or branch office (ROBO) and departmental workloads.

Virtualized, multiple-application workloads

For many organizations, the transition from application-dedicated servers to virtualized infrastructures has mitigated certain challenges while introducing others. One reason for this dilemma is that, for all its benefits, virtualization has not removed the need to manage hardware.



Virtualized storage blade

Dell EqualLogic PS-M4110 iSCSI blade arrays offer virtualized, enterprise-class storage combined with EqualLogic storage intelligence capabilities in a blade form factor. View this video to see how this blade array provides virtualized storage in the Dell Converged Blade Data Center.

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Implementation of virtualized Dell EqualLogic PS-M4110 blade arrays offers a shared-storage approach that is well suited for virtualization-based consolidation inside a blade chassis. EqualLogic PS-M4110 blade arrays tightly integrate with VMware vSphere® and Microsoft Hyper-V® virtualization, enabling storage management from within virtual machine environments. Additionally, integration with VMware vSphere Storage APIs – Array Integration (VAAI) enables EqualLogic PS-M4110 arrays to offload storage-related tasks from servers to storage for enhanced application performance.

Maintaining business continuity through implementation of data protection and recovery capabilities in virtualized environments is an important consideration for IT decision makers planning to consolidate data center resources. Auto-Snapshot Manager/VMware Edition (ASM/VE), Auto-Snapshot Manager/Microsoft Edition (ASM/ME), and Auto-Snapshot Manager/Linux Edition (ASM/LE) support automatic creation of platform-aware clones, snapshots, and replicas for advanced data protection of virtualization environments.

Virtual desktop infrastructure

VDI deployments can be especially challenging for storage infrastructures. They often grow rapidly, starting off as small pilot projects but expanding quickly throughout an organization. VDI deployments are also

subject to spikes in storage demand because of I/O storms that tend to occur during heavy activity periods, such as numerous concurrent boot-up, log-in, and log-out operations. To meet end-user performance demands, VDI deployments often utilize expensive, high-performance storage such as SSDs, which can increase costs significantly.

The EqualLogic PS-M4110 blade array is designed to meet the performance, scalability, and manageability demands of VDI deployments. The integrated compute, switching, and storage of the Dell Converged Blade Data Center architecture enables rapid, self-contained deployment and easy scalability. Integration with hypervisors such as vSphere and Hyper-V offers rapid provisioning of virtual machines and streamlined management. Additionally, hybrid arrays with a mix of SSD and SAS drives, combined with automated load balancing and tiering functionality, can be highly adaptive to spikes in demand. And thin clone capability allows space-efficient, cost-effective deployment of virtual machines in high-growth environments.

Remote or branch offices and departmental workloads

Organizations that encompass geographically dispersed centers of competence, regional centers, or other ROBO sites may often need IT infrastructures on location. Other organizations may require dedicated compute, networking, and storage infrastructures in close proximity to—or even coresident with—primary data centers.

The Dell Converged Blade Data Center offers numerous advantages to this approach because of its agile scalability, deployment flexibility, and streamlined manageability. Moreover, organizations using Dell EqualLogic storage in both primary and adjunct data centers can activate the Auto-Replication feature of the platform to automatically back up data across locations as part of a disaster avoidance strategy. EqualLogic pre-integration with leading-edge

host and application platforms helps improve data protection within converged solutions and simplify management at the solution level.

Integrated enterprise-class blade storage

Organizations moving toward a converged infrastructure can reduce the physical footprint, ease management, and enhance the efficiency of their data centers. The Dell Converged Blade Data Center architecture enables organizations to put a converged infrastructure strategy into action by integrating blade server, networking resources, and blade storage in a Dell PowerEdge M1000e chassis.

In an era of tremendous data growth and complexity in virtualized environments, storage is a critical component for converged infrastructures. The Dell EqualLogic PS-M4110 blade array provides virtualized, enterprise-scale storage that fortifies consolidated environments with EqualLogic intelligence features for data protection and disaster recovery. This innovative EqualLogic storage alternative in a blade form factor enables organizations to enhance efficiency and business continuity, centralize management, and boost productivity in their IT environments to accelerate business outcomes. **PS**

Authors

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